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Risk Factors for affecting Young People's HIV Status (age 15 – 24) in Voluntary Mobile Counseling and Testing in 40 Towns of Oromiya, Amhara and Afar Regional States, Ethiopia

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Acronyms

ACIPH	Addis Continental Institute of Public Health
AIDS	Acquired Immune Deficiency Syndrome
ANC	Anti-Natal Care
ART	Anti-Retroviral Therapy
BSS	Behavioral Surveillance Survey
CBO	Community Based Organizations
CDC	Centre for Disease Control
CI	Confidence Interval
CSA	Central Statistical Agency
CT	Counseling and Testing
DHS	Demographic and Health Survey
FSW	Female Sex Worker
GAMET	Global AIDS Monitoring and Evaluation Team
HAPCO	HIV/AIDS Prevention and Control Office
HCT	HIV Counseling and Testing
HIV	Human Immune-deficiency Virus
MARPs	Most At-Risk Populations
MCT	Mobile Counseling and Testing
NGO	Non-Governmental Organizations
OSSA	Organization for Social Support for AIDS Patients
PLHA	People Living with HIV/AIDS
PSP-E	Private Sector Program for TB and HIV in Ethiopia
SD	Standard Deviation
STI/STD	Sexually Transmitted Infection / Diseases
TB	Tuberculosis
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
UoG	University of Gondar
USAID	United States Agency for International Development
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

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Abstract

Background: The vast majority of young people (age 15-24) in Ethiopia remain uninformed about their HIV status. HIV prevalence is higher particularly among urban young population than rural with low risk perceptions, high levels of unprotected sex with multiple non-cohabiting sexual partners and low utilization of condoms. However, risk factors that exposed young people to HIV have not been studied much in the country.

Objectives: The main objective of the study is to determine the risk factors for HIV positive young people (age 15 – 24) that accessed mobile counseling and testing sites in forty towns of Ethiopia.

Methods: The study is a cross-sectional survey that utilized a pre-coded and structured national VCT client intake form. The client intake questionnaire is filled by the counselor. All young clients (age 15-24) who came to the mobile sites were included in the survey. Univariate, bivariate and multivariate (logistics regression) were used to analyze the risk factors that affect HIV status of young people.

Results: An overall HIV prevalence of 2.4 was observed among young people (female=4.9 and male = 1.0). A 5 times higher risk of contracting HIV was documented among young women compared to young men (AOR=4.7). The risk of HIV was three times higher among those who reported having sexual experience compared to those who hadn't (AOR=2.7). An excess risk of HIV was also noted among young people who ever contracted STI (AOR=2.9) and who engaged in transactional sex (AOR=2). Certain segments of young people (age group 20-24, divorced, widow/er, FSWs, who engaged in small businesses, self employed, employed at public/private, and unskilled laborers) appeared to carry excess risks of HIV. Attended a tertiary education level and previously tested for HIV found to be protective for young people from acquiring HIV.

Conclusion and Recommendations: HIV affects young people who are involved in low economic status occupations, less educated, those who practice risky behaviors like not using condom at last risk sex, having multiple sexual partners, and those who ever contracted STI. Effective community mobilization strategy should be designed to attract high risk young people to the MCT and eventually to link them to other prevention programs and care and support services.

I. Introduction

Since it was first recognized [1], the HIV epidemic in Ethiopia has evolved into a generalized epidemic, and AIDS is still the leading cause of morbidity and mortality among young people and adults in Ethiopia [2-4]. According to the National Single Point Estimate of HIV Prevalence in Ethiopia, adult prevalence for 2007 is estimated at 2.1%, of which 7.7% is urban and 0.9% rural. The number of people living with HIV/AIDS is about 977,394. There was a striking difference in the prevalence and number of people living with HIV in urban areas (7.7% and 602, 740 respectively) than rural areas (0.9% and 374, 654 respectively) [5-7]. According to 2005 Ethiopian Demographic and Health Survey (EDHS), the female to male infection ratio was 2.1, leaving females at high prevalence [8].

As depicted in the 5th Report of AIDS in Ethiopia, among the ANC attendees, the highest prevalence (4.3%) was observed in the age group 15 – 24. [9] About 91% of HIV infection was estimated to occur in the age group 15 – 49; implied that the highest prevalence in this age group is due to early commencement of sexual debut, initiation of sexual activities including sexual violence and child prostitution. [5,10-14]

Young populations (15-24 years), especially females, face the greatest risk of HIV infection in Ethiopia, with prevalence rates much higher than the average for both urban and rural areas as well as all women of reproductive age [3,5-6,10-15]. According to the 2005 BSS of Ethiopia, the prevalence of pre-marital sex in the in-school youth was 9.9% in which more males had been engaged in pre-marital sex than females (14.6% in males Vs 5.3% in females). Pre-marital sex was higher in out-of- School youth (19.8%) than the in-school ones. Out-of-school youth were 4.6 times more likely to have had sex than the younger ones (95%

CI 3.6, 5.9), and that females were 2.9 times more likely than males to have ever had sex (95% CI 2.2, 3.7) [15-16].

As studies on the prevalence of condoms showed only a small increase in condom utilization in high school students in Gondar and Addis Ababa vis a vis to the increased sales of condom in the country. [17-18] The major attributing factors for the low utilization of condoms are negative attitudes towards condom use: perceived reduction in sexual pleasure, promiscuity and distrust between partners, [19] deep seated religious beliefs about condom as sinful act are some among others. [20] It has been observed in Ethiopia BSS II that misconceptions on HIV/AIDS, particularly related to condoms, have continued to exist and fuelled transmission of HIV. The worse scenario is a high level of misconceptions was found amongst the youth. Though enough attention has been given to addressing misconceptions, comprehensive knowledge of HIV/AIDS among the youth is very low. [10,11-14,16]

If young people are still hopes for the future and development is concerned as HIV and its burden substantially influenced the younger generation, preventive services are critical. As it was depicted in the 2005 BSS of Ethiopia, risk perceptions among young people were very low; there have been high levels of unprotected sex; higher STI symptoms observed; and low utilization of condoms among these segments of the population. The magnitude and burden of HIV/AIDS is worse among young people in urban residents than rural [16]. In spite of the high risk-behaviors young people are practicing and the burden and magnitude of HIV outweighed in this segment of the population, there have been only a handful of studies conducted on the epidemic of HIV and its impacts among young people in Ethiopia. Even those are focused on VCT clients from static VCT centers in urban areas [10,17,21-25] and few others in school populations [11-14].

Recognizing the fact that young people are at the center of development and are not sufficiently reached with available HIV services, The United States Agency for International Development (USAID) has been supporting the Government of Ethiopia in establishing mobile counseling and testing services for the at risk population groups in urban areas of the country since July 2007 through the Private Sector Program for TB and HIV in Ethiopia [26]. PSP-Ethiopia has designed a mobile counseling and testing program in Ethiopia that targets the at-risk populations. The program has been implemented since July 2007. By December 2008, 69,144 clients received HCT and referrals for care and support for those who needed. The mobile counseling and testing program has been implemented in Ethiopia following the major transport corridors from Addis Ababa to Metema, Woldiya, Djibuti, and Moyale.

This research paper analyzes and determines the prevalence of HIV and associated risk factors among young people age 15 – 24 in a mobile setting. Specifically it tries to explore young people's risk factors associated with their HIV status and hence provides recommendations that would assist in improving program implementation - better reach at-risk young population as they are the most affected and impacted segment of the population in the country.

II. Literature Review

Since the first AIDS cases observed in June 1981 in the United States of America [27], many countries and populations are affected and impacted; Sub-Saharan Africa is the hardest hit even in the third decade of the pandemic. [27-29] In countries most heavily affected, HIV has reduced life expectancy by more than 20 years, slowed economic growth, and deepened household poverty. In sub-Saharan Africa alone, the epidemic has orphaned nearly 12 million children aged under 18 years. The natural age distribution in many national populations in sub-Saharan Africa has been dramatically skewed by HIV, with potentially hazardous consequences for the transfer of knowledge and values from one generation to the next. According to the United Nations Development Program (UNDP), HIV has inflicted the single most devastating problem to development in modern history. [27,29]

According to the 2003 United Nations Population Fund (UNFPA) report, nearly half of the world's six billion people are under the age of 25 [30]. World Health Organization (WHO) defines young people as the ages of 10 – 24 [31]. Today's young people carry the highest risk of HIV infection and they have the greatest challenges to prevent new infections. Young people's particular vulnerability is a key reason for focusing on HIV prevention and care efforts under the age of 25. Most young people begin sexual activity during adolescence, with many even having sex before age of 15 [29-38]. Risk of HIV increases as the number of sexual partners increases. Having multiple sexual partners, in most cases, affects the risk of HIV among young people particularly young women. [37-41] The risk of HIV infection is commonly linked to young people not just young people are having sex, but also their lack of knowledge and information to prevent themselves and lack of access to condoms [30-36,39-40,42-44]. Although a majority have heard of AIDS, many do not know how HIV is spread and do not believe they are at risk. Those young people who do know something about HIV

often do not protect themselves because they lack the skills, the support or the means to adopt safe behaviors [30,32-36,39-40,42-43,45].

Condom utilization is very low among adolescent men and women. Many adolescents, especially in rural areas, do not know where to obtain condoms; young men are more likely to know of a source than young women. Condom use is rare among married 15–19-year-olds; it is much more common among unmarried sexually active adolescents, but in some countries, fewer than 20% of women and 40% of men used a condom the last time they had intercourse [36]. Behavioral, physiological and socio-cultural factors put young people more vulnerable than adults to HIV infection. Adolescence is a time when young people naturally explore and take risks in many aspects of their lives, including sexual relationships. In every country except Ethiopia, Nigeria, Rwanda, Senegal and Zimbabwe, about eight in 10 or more women have had sexual inter-course without condoms. Those who have sex may change partners frequently, have more than one partner and hence engage in unprotected sex. All of these behaviors aggravate young people's risk of contracting HIV [36-37,44].

Today's youth have faced enormous challenges of AIDS impacts killing them and their friends, their brothers and sisters, parents, teachers and role models. An estimated 11.8 million young people aged 15 to 24 are living with HIV/AIDS. Each day, nearly 6,000 young people between the ages of 15 and 24 become infected with HIV. Yet only a fraction of them know they are infected. [30,32-36,45]

Many segments of young people are at particular risk of HIV infection. These include girls and young women; young people who are the target of coerced sex; those engaged in commercial sex; young men who have sex with men; young people living on the streets;

young people living in conflict areas; and young people whose parents have died of AIDS [31,39,45]. Vulnerability of girls and young women deserves particular emphasis. Of 12 million young people living with HIV/AIDS, 62 percent are young women, and in 20 African countries, 5 percent or more of young women are infected with HIV [30-31,33]. Of newly infected young people in the age bracket 15-19 in Sub-Saharan Africa, two-thirds are female. Six times as many girls as boys in rural Uganda, eight times as many girls as boys in Kenya and sixteen times as many girls as boys in Zambia are infected with HIV, respectively [30-31,33,35].

Sub-Saharan Africa is characterized by generalized epidemics of HIV to which the main mode of HIV transmission is heterosexual contact. This generalized epidemic is also driven by young people. HIV prevalence among young people in this sub-continent varies significantly from country to country. HIV prevalence among young pregnant women, for instance, varies from 1% in Senegal to 40% in Swaziland. In generalized epidemics, HIV prevalence among young women outweighed that of prevalence among young men. In 11 countries with nationally representative surveys of HIV prevalence, young women aged 15–24 years were between 1.3 times and 12 times more likely to be infected than young men. Adolescent girls are, in particular, vulnerable to HIV infection. About two thirds of newly infected young people aged 15–19 years in sub-Saharan Africa are females [37,44,46].

The social reasons why young women have higher HIV prevalence and incidence than young men include the fact that many women are younger, sometimes considerably younger, than their male sexual partners. In most countries, women usually get married in their teens to considerably older men, who are likely to have had more sexual partners; thus marriage may increase young women's risk of HIV/AIDS [36-38]. In most countries, at least 80% of

women have had sex by age 20; among men, the proportion ranges from 40% to more than 80%. Among sexually experienced 15–19-year-olds (both married and unmarried), larger proportions of men than of women have had two or more partners in the past year—more than 40% of men in some countries, compared with fewer than 10% of women in almost all countries. Studies from several countries show that the prevalence of HIV among young women who reported having had sex with older men is significantly higher than the prevalence among those who had sex only with partners their own age [36-37,47]. In a survey among young women aged 15–19 in rural Zimbabwe, the risk of HIV infection was significantly associated with the age of their most recent sexual partner [48]. Sexual relationships between young women and older men, whether inside marriage or outside, have the potential to drive the spread of HIV in high-prevalence generalized epidemics [35-36,38]

STIs play a large part in the spread of HIV in many populations [38,49-50]. For example, a study in South Africa showed that young men infected with herpes simplex virus–type 2 (HSV-2) were 5 times more likely to be HIV positive than sexually active people who were not infected with HSV-2. Young women with HSV-2 were 8 times more likely to be infected with HIV [38,50-51]. As WHO's estimates show us more than 100 million STIs, excluding HIV, occur each year among people younger than age 25 [52]. The majority of young people who acquire an STI take some action to prevent transmission, but many do not tell their partners about the infection [35,49,52]

As far as HIV is concerned, young people are at the centre of the global HIV/AIDS pandemic. They also are the world's greatest hope in the struggle against this fatal disease [27]. In areas where the spread of HIV/AIDS is subsiding or even declining, it is primarily because young men and women are being given the tools and the incentives to adopt safe

behaviors. Young people have demonstrated that they are capable of making responsible choices to protect themselves when provided such support, and that they can educate and motivate others to make safe choices. [30,32-36]

Ethiopia is among the countries, which are hardly hit by the pandemic. Since the onset of the pandemic in 1980s, the country is also one of the high burden countries in terms of people living with HIV/AIDS (PLHAs). [1,53] HIV/AIDS is causing a huge impact on young adult mortality. [3,53] As indicated in the 5th report of AIDS in Ethiopia, deaths occurring due to AIDS was estimated about a third of all young adults in the country. The high mortality due to AIDS has also caused a significant reduction in life expectancy. [3,53] Sanders et al explained in a study of "Mortality Impact of AIDS in Addis Ababa" that the probability of death between age 15 and 49 was estimated attributing excess mortality to HIV infection. The study further described that young Ethiopian men and women have almost equal probability of dying of HIV infection before they reach to the age of 60 [3,54]

According to the 2005 ANC and BSS survey [1,16], there is high level of awareness and behavior change among the general populations; decrease pre-marital sex; and prevalence is stabilizing and declining particularly in major towns. However, misconception about HIV is still wide spread. The urban prevalence is unacceptably high rate (10.5%). Prevalence of condom use is very optimal and service coverage, especially voluntary counseling and testing services are too low (5%) [3,15-16]. Even though the overall prevalence of HIV is stabilizing in Ethiopia, because of the large population and dimensions of the impacts of HIV, absolute number of persons infected and affected by HIV is very significant. Above all, the pandemic still threatens the productive segment of Ethiopian population and the future of hope – youth

and these calls for Government, citizens, institutions and partners' integrated approach to tackle the pandemic [5]

In 2002, a study conducted among young people in Addis Ababa found an HIV prevalence of 3.0 with disparities among in-school (0.3%) and out-of-school (5.3%) [13]. From 2002 to 2004, HIV Prevalence among young people in two model VCT centers in Addis Ababa (OSSA and Zewditu Hospital) declined from 22% (in 2002) to 9%(in 2004) [4]. Condom use during last sexual encounter among those young people in the two sites never exceeded 35% [4]. Ethiopia's ANC data in 2005 showed a 9.1% HIV prevalence among young people in the country [5]; while Ethiopia's DHS in the same year found a 2.2% HIV prevalence among young women and 0.1% among young men [8].

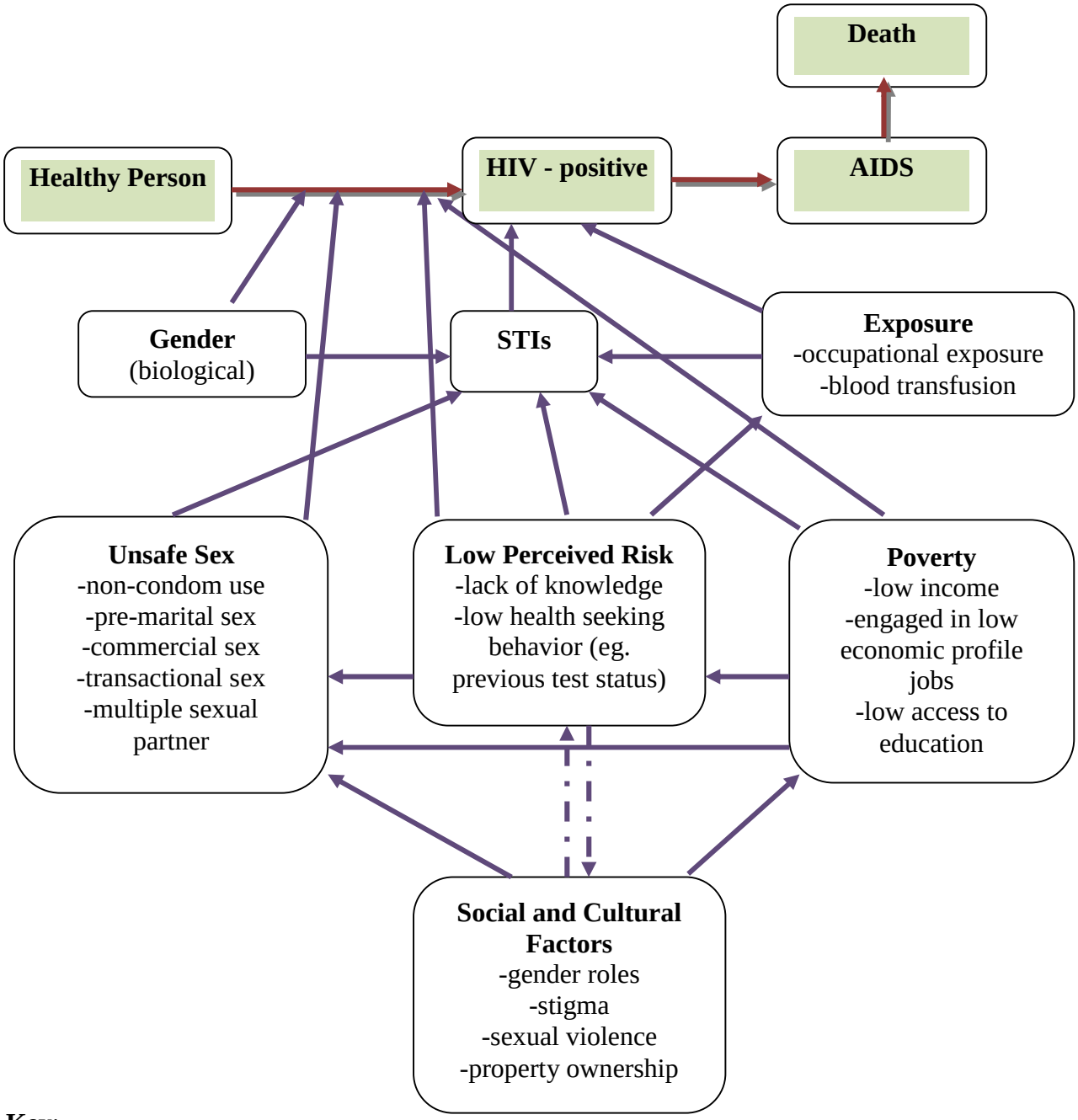
Low socio economic status of females is associated with high divorce rates, low access to health care and education. It is also identified as status of women is associated with heavy workloads and prostitution as a result of early marriage and child bearing. These factors drive young women to enter into prostitution and sex work. [20,55] Commercial sex can be attributed to increased susceptibility to HIV infection and ability to transmit HIV when co-infected with other STIs, and the broad population groups they reach through their clients [15,56-57]. Though the current size of sex worker population in Ethiopia is not known, in 1990 it was estimated that about 7.1% of the sexually active female population of Addis Ababa were sex workers. Different studies showed that there is high concentration of commercial sex workers in the major towns in the country [15-16,56-58]. The majority of these sex workers are below age 25 that complicates the risk and burden of the problem.

Highly mobile men, particularly long distance truck drivers are known to be at increased risk of HIV infection, and may be the group at highest risk next to sex workers. HIV prevalence was already 13% in truck drivers in 1988. In 1989 the prevalence among truck drivers increased to 17.3%. Very high prevalence rates were documented in 1994 (40%) and 1995 (26.7%) among drivers in Gondar, Northwest Ethiopia [11,16].

Recognizing the fact that young people are at the center of development, the Government of Ethiopia, apart from the policy enactments and strategies developed from 1985 to 1998 [59], initiated voluntary counseling and testing and provider initiated counseling and testing in the country in 1998 and 2005, respectively. Following this, different local and international NGOs, and other bilateral organizations have been involved in the effort to curb the virus. Currently in Ethiopia, there are 768 VCT centers and more than 330 health facilities offering provider initiated counseling and testing at TB clinics. The prevalence of HIV among VCT clients according to 2005 figures was 13.7% and a higher prevalence was observed among female clients, many of whom were young people below age 25 [15-16]. However, VCT services in Ethiopia are still scarce and the demand is very high and is increasing throughout the country [15].

III. Conceptual Framework

Based on the problem statements and review of literatures, the following conceptual framework was developed linking young people's risk factors and their HIV positivity.



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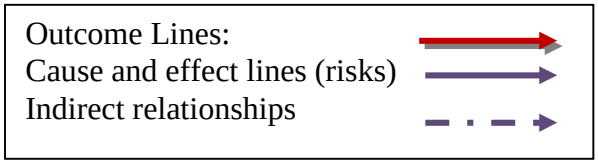


IV. Objectives of the Study

The main objective of the study is to determine the risk factors for HIV positivity among young people (age 15 – 24) that accessed mobile counseling and testing sites in forty towns of Ethiopia since July 2007.

More specifically, the study objectives are:

- To assess HIV prevalence among young people (age 15 – 24) attending the mobile counseling and testing sites, and
- To identify the determinant risk factors for HIV positivity in the age group 15 – 24.

V. Methodology

4.1 Study Setting:

4.1.1 The Service: Mobile Counseling and Testing

There are different models of HIV counseling and testing which include stand alone, integrated, private sector, home based and mobile. Each has its own benefits and challenges. The main benefit of mobile approach is the fact that it can be easier to reach the hard to reach population by bringing services to beneficiaries. As part of voluntary counseling and testing scheme of integrated HIV and AIDS prevention, care and support services, mobile counseling and testing is a modality of undertaking VCT at mobile sites; near to target groups and specific segments of the population. [60-61]. USAID's Private Sector Program for TB and HIV in Ethiopia (PSP-E) contracted a mobile counseling and testing project from USAID Ethiopia to deliver VCT and its associated referral services in urban areas of Ethiopia. The approach of the service delivery differs from the static and outreach services (through a mobile service in a van) rendered by many other institutions. A mobile team comprised of five counselors, one lab technician, one receptionist, and two guards spend five days starting from Tuesday to Saturday in each selected town (two-three teams per town) and are expected to counsel fifteen clients per counselor per day on the average. The counselors are recruited with a prior set of selection criteria (who have a recognized training on counseling and testing by the respective authority, proven experience of counseling and testing, be a resident out of the testing town to avoid stigma and maintain confidentiality, and have valid license of delivering counseling and testing) [26]

The program aims to establish referral linkages with private and public institutions to address those who are in need of other referral services and care and support after the testing.

Basically, those who are positive for HIV will be 100% referred to other care and support services or further diagnosis and treatment, with their prior consent. [26]

This mobile CT is new to Ethiopia (Centre for Disease Control is also implementing mobile counseling and testing through a local NGO - Organization for Social Support for AIDS patients /OSSA/) that it uses mobile team and serves the community using tents. The tents are situated at selected sites (selected based on criteria developed together with Town Health Offices, Kebele Administration, Town Municipality, Police and others as a standard). The mobile counseling and testing with the modality of delivering services using tents was initiated for the first time in Ethiopia in 40 towns of Ethiopia. [26]

4.2 Study Design

The study is a cross-sectional survey in sites providing mobile counseling and testing services. Trained and licensed counselors were deployed to conduct the counseling and testing services and collect client records using standardized national formats.

4.3 Sample Size

Sampling is a critical element of any survey, research or study [62]. In this study, all young clients who voluntarily take counseling and testing and receive their test results are included in the study. All VCT clients were self-selected themselves to attend the HIV counseling and testing services. Young clients who selected themselves voluntarily and attended the mobile VCT sites during July 2007 – December 2008 were included in the study.

4.4 Data Collection

The client intake questionnaire (a national format, which was initially developed by Centers for Disease Control) was filled by counselors in a way that didn't affect their formal

counseling sessions. The records further verified with the VCT registries and laboratory test result forms that were packaged in a plastic folder. Client information and VCT data was recorded by the counselors who, at the same time, conduct the primary task of counseling and testing at the sites. Lab technicians were also other primary data collectors to fill client's HIV test result. In-depth training sessions were organized for the counselors and lab technicians in the field before the beginning of the actual counseling and testing services.

Socio-demographic characteristics of clients, risk factors, reasons for accessing mobile CT sites, sexuality and sexual behavior variables and test result are the major study variables of young clients in the age group 15 -24. Client data is collected from July 2007 to December 2008 for a period of a year and half in forty towns that fall in major transport corridors of Oromiya, Amhara and Afar Regional States of Ethiopia. A total of 37,771 (54.6% of 69,141 all age clients) young clients (age 15-24), who sought VCT services voluntarily, were, recruited at the mobile CT sites in the specified period.

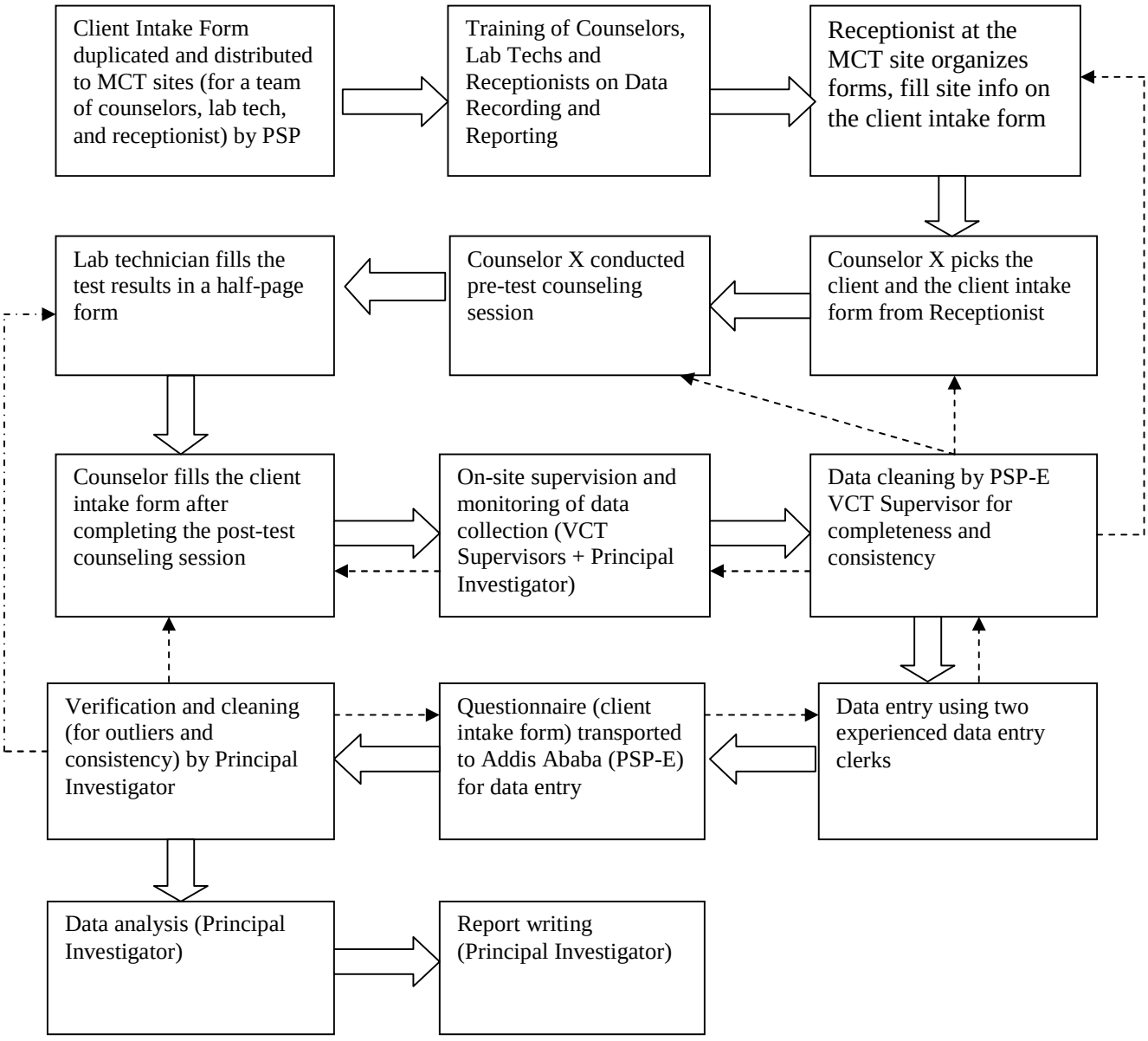
4.5 Data Entry and Management

Filled client intake forms with supporting lab HIV test result and weekly summary reports that validates the number of clients and their test results with anonymous codes printed on the forms were collected from sites to PSP-E office (Addis Ababa) every week. The client intake forms were further verified by PSP-E full time VCT supervisors. Data cleaning was done by the VCT supervisors at the data collection phase. The following is a schematic diagram of the overall data collection, analysis and reporting:

Data entry was done using EpiInfo version 3.3.2 with experienced data entry clerks recruited full time by PSP-E. The data entry clerks have been with PSP-E for more than a year since

initiation of the project. Cleaning was also done at the data entry level; by consulting other VCT registries and communication with counselors out in the MCT sites.

Fig 1: Schematic Diagram of Data Collection and Management



4.6 Data Analysis

The outcome of the study is HIV status of young clients while the exposure is a risk factor/sexual behavior that exposed a client to the virus. The data analysis is a combination of univariate, bivariate and multi-variate statistical techniques. The analysis first considered association of risk factors (socio-demographic characteristics, condom use last sex, condom use last 3 months, multiple sexual partners, sex in exchange for money/gift, STI history, being a sex worker, etc) with HIV sero-status. Second, a multivariate analysis of the risk factors and HIV status of young people (logistic regression – step-wise inclusion) was done. Wald test and/or Chi-square were used to see the significance of individual variables in the model and to see the degree of association between risk factors, demographics and HIV sero-status of young people.

4.7 Ethical Considerations

Institutional ethical review of the study protocol was obtained from University of Gondar. Permission to conduct the study was also obtained from PSP-Ethiopia and Oromiya, Amhara and Afar Regional Health Bureaus. The client intake record was fully anonymous (no names in the form). The form was also printed with random codes to maintain anonymity and avoid duplication of codes and data mismatch

4.8 Operational Definitions

- **Ever had sex**: Ever started sexual intercourse with a partner (marital or non-marital)
- **Risky sex**: any unprotected sex (condom non-use) with any partner other than a regular partner.
- **At-risk population**: segment of population groups who engaged in risky sex and/or other behaviors that expose them for HIV

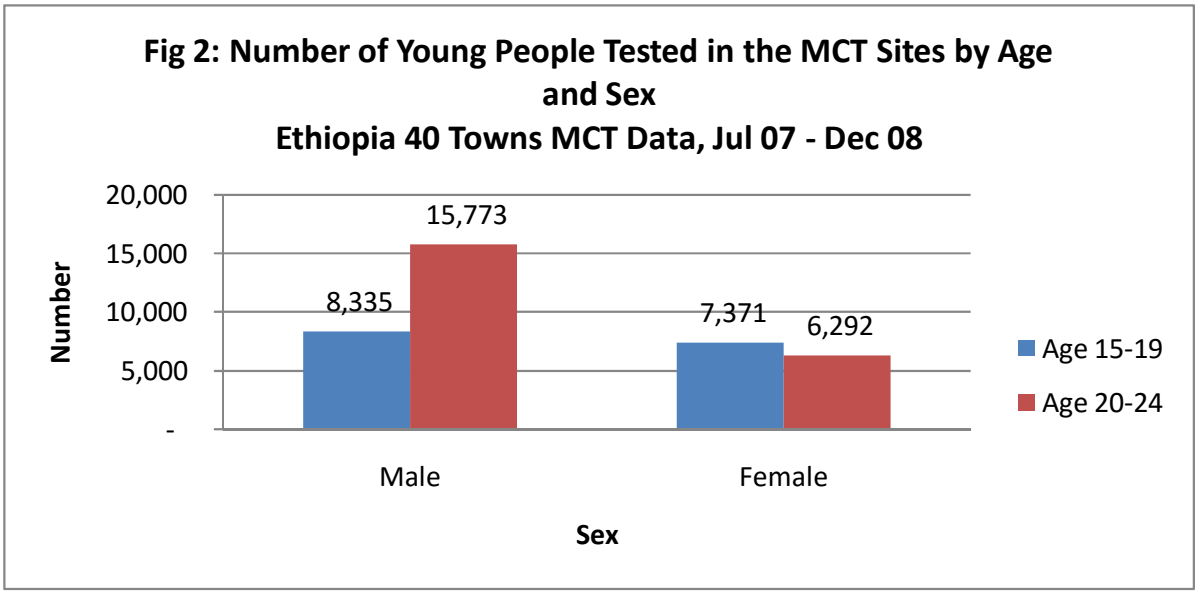
- **Young people**: young men and women in the age group 15-24 (WHO def.)
- **Mobile Counseling and Testing (MCT)**: is a modality of delivering VCT at temporary sites using a tent; near to target groups and specific segments of the population.
- **Steady partner**: a boy friend/fiancé/someone in consensual union
- **Casual partner**: someone not a spouse or not a steady partner
- **Multiple sexual partners**: more than one sexual partner.
- **Client**: a client is a young male or female who accessed mobile counseling and testing sites
- **Plan for future**: a reason of young clients to primarily access mobile VCT services. It is to mean that be aware of the risk of HIV and prepare himself/herself for protecting from future risks

VI. Findings of the Study

6.1 Socio-Demographic Characteristics of Young People

A total of 69,141 clients tested and counseled from July 2007 to December 2008 in 40 towns of Ethiopia. Out of those tested, young people of age 15 – 24 comprised 54.6% (37,771). This study focused on young people of the afore-mentioned age group. More than half (58.4% or 22,058) of the young people tested were in the age group 20–24 for both sexes; while mean ages among young men and women are 20.4 (SD±1.86) and 19.6 (SD±1.85) respectively. Young men clients constituted 64% (24,108) of the total clients in the study.

Nearly eighty percent (79.8% or 30,141) of the young clients was never married followed by currently married (13.9% or 5,250) implied that never married are the dominant (self-selected) group of young MCT clients. The remaining separated/divorced/widowed constitutes 5.8% (2,191) of the total clients under the study. Sex discrepancy of marital status of the clients is vivid in Table 1 as 88.8% (21,408) of young men and 63.9% (8,731) of young women were never married. Similarly, three folds of young women were currently married than young men. Close to half (46.4% or 17,526) of young clients attained secondary education followed by those who attained primary education (32.0% or 12,087). Nearly one-tenth (9.9% or 3739) of young clients were illiterate. In general, young men seemed to be more educated than young women.



Forty four percent (43.9% or 16,581) of young clients were students and thirty-one percent (30.6% or 11,558) unskilled laborers. As expected, the students are in most cases never married. There is an increase of 10% of female unskilled laborers than males. Seven percent (2,682) of young clients were employed at different private and public sector and 3.3% (1,246) were self employed. The proportion of farmers, drivers, uniformed workers, and those involved in small businesses were 4.0% (1,511), 1.7% (642), 1.4% (529), and 1.4% (529) respectively. Female sex workers (FSWs) constituted 1.7% (237) of the total female clients.

Table 1: Percentage Distribution of Male and Female MCT Clients according to their Socio-Demographic Characteristics

Socio-Demographic Characteristics	Male N=24,108	Female N=13,663	Total N=37,771
Age			
15-19	34.6	53.9	41.6
20-24	65.4	46.1	58.4
Mean age (95% CI)	20.4	19.6	20.1
Marital status			
Currently married	8.2	24.1	13.9
Never married	88.8	63.9	79.8
Divorced/separated/widowed	2.5	11.6	5.8
Missing	0.6	0.4	0.5
Education			
Illiterate	6.8	15.3	9.9
Able to read	1.6	1.3	1.5
Primary	31.9	32.1	32.0
Secondary	48.4	42.9	46.4
Tertiary	10.4	7.5	9.3
Other	0.9	0.8	0.9
Occupation			
Self employed	3.3	3.1	3.3
Employed @ private/public	8.1	5.4	7.1
Unskilled laborers	26.7	37.6	30.6
Student	43.6	44.5	43.9
Armed force	2.1	0.2	1.4
Farmer	5.9	0.6	4.0
Driver	2.7	0.0	1.7
FSWs	NA	1.7	0.6
Small businesses	1.8	0.8	1.4
Other (not mentioned)	5.9	6.1	6.0
All	63.8	36.2	100

Table 2 shows about sexual behaviors of young clients in the MCT sites. Young people in the MCT clients exhibited higher proportion of sexual experience as 51.9% (12,514) of males and 60.1% (8,217) of females ever had sexual contacts. Sexual experience is more likely higher among young females than young males (59.4% of women who have sexual

experience are either married or separated/divorced/widowed). Overall, thirty four percent (33.9% or 6,745) of young clients (male=41.0% or 4,943, female=22.9% or 1,802) used a condom during their most recent sexual encounter. Males are likely to use condom during their recent sexual encounter than their sex counterparts. Condom utilization among young clients is in general very low.

Young females seemed to have steady partners (36.5% or 4,991) more likely than young males, six months prior to the date of the survey. On the other hand, 14.8% (5,601) of young people have casual partners with a slight difference between young men and women. Out of those who have casual partners, thirty percent (30.2%, 11392) of them have one casual partner; 4.1% (1,546) have two, 1.6% (607) has three and 2.9% (1,080) have four or more casual partners. There was no significant difference in having one casual partner among young women and men. Young women are more likely to have multiple casual sexual partners than young men (17.2% vs 2.5%) particularly for more than four casual partners. This could have been true because of the 89.7% of FSWs (out of 271 women who mentioned 4 or more casual sexual partners, 128 are FSWs). Though the issue of sexually transmitted infections (STIs) is, in most cases underreported, 3.3% (654) of young people admitted that they ever contracted STIs. Reported STI exposure appeared to be similar for both sexes (3.5% or 419 males and 3.0% or 236 females).

Table 2: Percentage Distribution of Young People (age 15-24) by some Selected Sexual Behavior

	Male N=24,108 %(n)	Female N=13,663 %(n)	Total N=37,771 %(n)
Ever had sex	51.9(12,514)	60.1(8,217)	54.9(20,731)
Condom use during last sex*	41.0(4,943)	22.9(1,802)	33.9(6,745)
Steady partners (last 6 months)*	23.7(5,708)	36.5(4,991)	28.3(10,699)
Casual partners (last 6 months)*	16.7(4,027)	11.5(1,574)	14.8(5,601)
Number of sexual partners (last 6 months)*			
0	64.2(15,468)	56.2(7,674)	61.3(23,142)
1	26.5(6,384)	36.7(5,008)	30.2(11,392)
2	4.7(1,134)	3.0(412)	4.1(1,546)
3	2.0(489)	0.9(118)	1.6(607)
4+	2.6(632)	3.3(448)	2.9(1,080)
History of STIs*	3.5(419)	3.0(236)	3.3(654)

* Ever had sex as denominator

Young MCT clients were asked about their perceived HIV risk as a reason for testing for HIV as categorized and explained in Table 3. The most important reason for both sexually active and not active young people to test for HIV in the MCT sites was dominantly reported as *plan for their future*. Sixteen percent (16.4% or 6,200) of clients reasoned out the purpose of their testing as *client had risk*, which was commonly cited sexually related risk factor. This risk of HIV was apparent among sexually active; while non-sexual related factors were mentioned more frequently among sexually not-active than sexually active young people. Get counseling (8.7% or 3,293), partner had risk (2.9% or 1,107), blood transfusion (2.4% or 913), not trust partner (2.0% or 756), and window test (1.9% or 722) were the other major reasons for young clients to get tested for HIV. Fifty-two percent (51.9% or 10,784) of sexually active clients perceived that their reason for testing for HIV was planning their

future followed by thirty-nine percent (39.4% or 8,206) of them admitting perceived risk of HIV (sexually related). While plan for the future is the most frequently cited and significant perceived risk factor to test for HIV among the not-sexually active young people.

Table 3: Percentage Distribution of Young Male and Female clients (age 15-24) according to their Perceived Risk and Sexual Activity

	Sexually not-active N=17,040 %(n)	**Sexually Active** N=20,731 %(n)	**Total** N= 37,771 %(n)
Perceived HIV risk (Sexual)	**NA**	**39.4(8,206)**	**21.7(8,206)**
▪ Client had risk		29.9(6,200)	16.4(6,200)
▪ Partner had risk		5.3(1,107)	2.9(1,107)
▪ Not trust partner		3.6(756)	2.0(756)
▪ Sexual assault		0.4(93)	0.2(93)
▪ Death/illness of partner		0.2(50)	0.1(50)
Perceived HIV risk (Non-sexual)	**5.1(871)**	**1.4(295)**	**3.1(1,166)**
▪ Blood/fluid exposure	4.0(685)	1.1(228)	2.4(913)
▪ Occupational exposure	1.1(186)	0.3(67)	0.7(253)
Suspected/known HIV/AIDS:	**NA**	**4.7(999)**	**2.6(999)**
▪ Confirm positive test		0.2(45)	0.1(45)
▪ Get results of positive test		0.6(134)	0.4(134)
▪ Ill/symptoms		0.3(70)	0.2(70)
▪ Referred		0.1(27)	0.1(27)
▪ Window test		3.5(722)	1.9(722)
Plan for future:	**76.3(13016)**	**51.9(10784)**	**63.0(23788)**
▪ Premarital	1.1(191)	0.7(151)	0.9(342)
▪ Marital reunion	NA	0.2(32)	0.1(32)
▪ Family planning	0.0(1)	0.1(16)	0.0(17)
▪ Visa applicant	0.1(15)	0.1(23)	0.1(38)
▪ Get counseling	10.4(1,774)	7.3(1,519)	8.7(3,293)
▪ Test before pregnant	0.0(3)	0.1(30)	0.1(33)
▪ Pregnant	NA	0.2(49)	0.1(49)
▪ Plan future(unspecified)	64.7(11020)	43.2(8964)	52.9(19984)
▪ **Other reasons (not mentioned)**	**1.6(268)**	**1.6(334)**	**1.6(602)**

6.2 HIV Infection and Socio-Demographic Characteristics of Young People

Table 4 described socio-demographic characteristics of HIV-positive young men and women. The overall prevalence of HIV among young MCT clients was 2.4 with a female to male ratio of 5:1. HIV prevalence was also high among young clients in the age group 20-24 (3.1% or 681) than among age 15-19 (1.4% or 222).

In relation to marital status of young clients, HIV prevalence was observed high among separated/divorced/widowed (9.9% or 217) than the rest of the group. The rate among currently married young people was 5.1% (265), which is doubled the overall HIV prevalence among young people age 15-24. Education has an inverse relationship with the HIV prevalence among young people - HIV rate decreases as the education attainment increases with the highest among illiterate (6.8% or 255) and the lowest among those in tertiary education level (0.7% or 24). Occupation wise, certain categories of occupation appeared to carry high rate of HIV infection than the rest of the groups. As expected, high HIV prevalence was observed among female commercial sex workers (18.9% or 44).

HIV prevalence was also high among self employed (4.4% or 54), unskilled laborers (4.3% or 494), and among small businesses (2.8% or 15) as compared to the overall prevalence in the study group. The lowest prevalence was noted among students and armed forces (0.7% each). Surprisingly, the prevalence among farmers (1.5% or 23) seemed to be higher than the prevalence among students. Young people in the unspecified occupation group relatively showed high prevalence (3.8% or 73).

Table 4: Percentage Distribution of HIV-positive Young Men and Women by Socio-Demographics

Socio-Demographic Characteristics	Total=n	HIV-positive	
		%	n
Age			
15-19	15,670	1.4	222
20-24	22,025	3.1	681
Sex			
Male	24,066	1.0	238
Female	13,629	4.9	665
Marital status			
Currently married	5,239	5.1	265
Never married	30,083	1.4	418
Separated/Divorced/Widowed	2,181	9.9	217
Education			
Illiterate	3,723	6.8	255
Able to read	571	3.2	18
Primary	12,065	3.0	362
Secondary	17,490	1.4	238
Tertiary	3,517	0.7	24
Occupation			
Self employed	1,224	4.4	54
Employed @ private/public	2,685	2.1	57
Unskilled laborers	11,547	4.3	494
Student	16,548	0.7	110
Armed force	543	0.7	4
Farmer	1,491	1.5	23
Driver	643	2.0	13
FSWs	237	18.6	44
Small businesses	539	2.8	15
Other (not mentioned)	1,909	3.8	73
All	37,373*	2.4	889

* The HIV status of the remaining 398 young people was unknown by the time of the MCT service

Table 5 explains about HIV prevalence among young women groups against socio-demographic characteristics. Consequently, the overall HIV rate among young women was 4.9%(656) with much variation observed among age 15-19 and 20-24 (ratio: 2.9:1). The adjusted Odds Ratio is 3.2 with 95% confidence interval of 2.7-3.7. Young women who were separated/divorced/widowed became highly infected by the virus as the HIV rate in this group appeared to be 12.3%(196).

HIV prevalence among women has an inverse relationship with their education status. As education level of women increases, HIV prevalence declines (Chi-square=217.16, $p<0.0001$). The highest prevalence of HIV was observed among illiterate young women (10.1%) closely followed by the prevalence among those who were able to read and write (8.2%). The lowest HIV prevalence was observed among those in tertiary education level (1.6%).

In relation to women's occupation status, high HIV prevalence was noted among FSWs (18.6%), self employed (10.1%), and other employment categories (7.7%), which were not known. HIV prevalence among unskilled laborers (7.5%) young women who were engaged in small businesses (6.8%), those employed at public/private sector (5.3%) were still higher than that from the overall prevalence. Women farmers exhibited also a relatively higher HIV prevalence (4.7%) than students who exhibited the lowest prevalence (1.3%) in the group.

Table 5: Percentage Distribution of HIV-positive Young Women by Socio-Demographics

Socio-Demographic Characteristics	Total=n	HIV-positive	
		%	n
Age			
15-19	7,351	2.6	189
20-24	6,278	7.6	476
Marital status			
Currently married	3,276	6.7	221
Never married	8,708	2.8	245
Separated/Divorced/Widowed	1,588	12.3	196
Education			
Illiterate	2,089	10.1	211
Able to read	184	8.2	15
Primary	4,378	5.9	258
Secondary	5,846	2.8	161
Tertiary	1,020	1.6	16
Occupation			
Self employed	424	10.1	43
Employed @ private/public	729	5.3	39
Unskilled laborers	5,126	7.5	386
Student	6,065	1.3	78
Farmer	86	4.7	4
FSWs	236	18.6	44
Small businesses	103	6.8	7
Other (not mentioned)	710	7.7	55
All	13,511	4.9	656

6.3 HIV Infection and Sexual Behaviors of Young People

As shown in Table 6, HIV prevalence was ten times higher among those who reported having sexual experience compared to those who reported never having sex. A 4.7:1of female to male ratio of HIV prevalence was also noted among sexually active group. The small prevalence of 0.4% among those who reported never having had sex could be a combination of possible infection via non-sexual route and underreporting of sexual behavior by some of the clients.

A higher HIV prevalence was observed among those reporting having had steady sexual partners as compared to those without steady partners in the last 6 months (3.6% vs. 1.9%). A four times higher HIV prevalence was noted between females and males who have had steady partners. Higher prevalence of HIV (14.6%) was noted among those clients reported having four or more casual partners. The prevalence was high among women who reported having two or more casual partners (15.0 – 19.3% HIV rate). A dose-response relationship was also observed between HIV prevalence and the numbers of casual sexual partners (both sexes). The noted dose-response effect appeared much more pronounced in females.

There is no significant relationship between HIV prevalence and condom use at last risk sex (3.5% vs 3.6% prevalence among those not using condom and using condom during their recent sexual encounter, respectively). Clients who reported having transactional sex exhibited a four times higher HIV rate (10.1%) than who didn't practice transactional sex (2.6%). Similar distribution of HIV rate was observed among women and men among those who ever had transactional sex with a significant increase in the rate of infection among women than men.

The findings of this study showed a strong relationship between HIV and STIs ($p<0.0001$). HIV prevalence was documented as high as 11.5% among clients reporting having had STI in their lifetime, which is significantly higher than the 2.5% among those who did not report STD. In particular, 22.8% (60) of the female clients with a history of STD were tested positive for HIV.

Table 6: Percentage Distribution of HIV-positive Young Male and Female Clients according to Selected Sexual Behaviors/Practices

	Male		Female		Total	
	% HIV(n)	Total=n	% HIV(n)	Total=n	% HIV(n)	Total=n
Ever had sex						
No	0.3(28)	10,917	0.8(41)	5,166	0.4(69)	16,120
Yes	1.6(206)	12,496	7.5(618)	8,200	4.0(824)	20,731
Had steady partner (previous 6 months)						
No	0.8(152)	18,368	4.2(366)	8,651	1.9(518)	27,019
Yes	1.5(86)	5,698	6.0(299)	4,978	3.6(385)	10,676
# of casual partners (previous 6 months)						
1	1.7(42)	2,434	6.8(66)	972	3.2(108)	3,406
2	1.5(21)	1,375	19.3(48)	249	4.2(69)	1,624
3	4.4(5)	113	15.0(12)	80	8.8(17)	193
≥ 4	5.0(5)	100	18.1(49)	270	14.6(54)	370
Condom use last sex						
No	1.3(140)	10,630	5.9(442)	7,466	3.2(582)	18,096
Yes	1.4(74)	5,236	9.5(177)	1,861	3.5(251)	7,097
Transactional sex						
No	1.0(153)	14,651	5.0(451)	8,955	2.6(604)	23,606
Yes	2.4(19)	790	17.1(150)	879	10.1(169)	1,669
Ever contracted STI						
No	1.0(187)	18,405	5.2(553)	10,621	2.5(740)	29,026
Yes	5.4(26)	484	22.8(60)	263	11.5(86)	747

6.4 Multivariate Analysis of HIV Infection and Young People's Risk Factors to HIV

Findings of the multivariate analysis using Logistics regression are presented in Table 7. Selection of variables in the models (Model I and II) are made in such a way that socio-demographics are included in Model I and self reported factors of sexual behavior in Model II that accounted socio-demographics.

As shown in Table 7, client's sex, age, marital status, education status and client's occupation are significantly influencing risk of HIV infection among young people – Model I. The odds of HIV infection was 5 times higher among women than men and two times higher among young clients in the age group 20-24 than age 15-19. Same excess risk appears for females and males in the age group 20-24 compared to the reference age (15-19). The odds of being HIV-positive was also 5 times higher among widow/er groups than married ones. There was a 60% increase (each) in the risk of acquiring HIV among separated and divorced compared to married clients. Being separated or divorced are significant factors for women for risk of acquiring HIV (1.7 and 1.6 times, respectively, higher compared to married), while these factors are not significant among men. Being widower is a high risk factor for HIV among men (7 times higher compared to married) with slightly wide width of confidence interval due to low size of the denominator).

Attending a secondary or tertiary education level was noted as protective factors for risk of HIV among young clients as compared to illiterate groups. Thirty percent and 80% decrease of HIV risk, respectively, among the former groups of clients compared to illiterate clients. Attended a tertiary level education among young male clients is very much protective (90% lower risk) of contracting HIV compared to illiterate young men; while 70% lower risk of

HIV among young women in the same education level. Unlike young women, attending primary education is also protective for young men from acquiring HIV.

Excess HIV risk was noted among certain groups of clients in varying occupation compared to students (reference group with the lowest HIV rate documented as 0.7%). The highest excess HIV risk was documented among female sex workers (Adjusted Odds Ratio-AOR = 6.1), followed by young clients engaged in small businesses (like petty trade) (AOR=3.0), self employed (AOR=2.8), unskilled laborers (AOR=2.5), and young clients employed at public/private sector (AOR=2.5). Compared to students, women who are sex workers, self employed, unskilled laborers, and employed in public/private sector exhibited an excess risk of HIV; while young men who are working in small businesses (AOR=4.5), unskilled laborers (AOR=3.2) and employed – both self and at public/private (AOR=2.7) appeared to carry excess risk of HIV contrasted to students do.

Model II included, in addition to socio-demographics, factors related to sexual behavior. When socio-demographics are regressed with sexual behavioral factors, being female, those among in the age group 20-24, divorced and widow, self employed, employed at public/private, unskilled laborers, FSWs, those engaged in small businesses and those young people in occupations not mentioned are significantly carried excess risk of acquiring HIV in the overall sample. Similarly, the afore mentioned socio-demographic characteristics which were significantly affecting the overall sample of young people holds true for young women except young women engaged in small businesses. Young men's HIV positivity is highly influenced by unskilled labor, working in the public/private, engaged in small businesses and those working in the not-mentioned occupational profile. Age and marital status of young men don't affect their HIV status. Educational status of young people, in general, has a

protective factor for young women and men when socio-demographics are adjusted with sexual behaviors. Being in tertiary level education for all samples and women is the only protective factor from contracting HIV; while primary, secondary and tertiary educational levels are protective for young men.

Model II also adjusts for sexual experience (ever had sex), had sex in exchange for money or gifts, STI and previous testing history of clients. All of the sexual behavioral factors are significantly influencing clients' risk of HIV. The odds of becoming HIV-positive increased 2.7 times compared to those who don't have sexual experience. Compared to women who reported no sexual experience, those women who had sexual experience were 3.3 times more likely to be HIV positive. Young clients who have had sex in exchange for money exhibited a 2 times higher risk of HIV compared to who haven't had sex in exchange for money or gifts. This sexual characteristic holds insignificant for young men. Ever contracted STIs is also a determinant factor of acquiring HIV among young men and women. A 3 times excess risk of HIV was noted among young men and women (each) compared to those who have never contracted STIs.

Previous experience of testing for HIV has a protective factor for young clients from acquiring HIV. A 50% lower risk of HIV was marked among young clients who were previously tested compared to those who didn't. This protective nature of previous testing experience was confirmed separately among young women and men.

Young people's (both sexes) condom use during their last sexual encounter appeared to be in-significant in affecting the outcome of HIV status.

Table 7: Results of Multivariate Analysis (Logistics Regression - Gender disaggregated, Age 15 -24)

Socio-Demographic and Behavioral Characteristics	All Samples (Adjusted OR, 95% CI)		Women (Adjusted OR, 95% CI)		Men (Adjusted OR, 95% CI)	
	Model I	Model II	Model I	Model II	Model I	Model II
Socio-demographics:						
Sex						
Male (ref)	1.0	1.0				
Female	4.6(3.7-5.7)	4.7(3.8-5.8)				
Age						
15-19(ref)	1.0	1.0	1.0	1.0	1.0	1.0
20-24	1.8(1.5-2.2)	1.8(1.4-2.1)	1.8(1.5-2.2)	1.8(1.5-2.2)	1.7(1.1-2.8)	1.7(1.0-2.7)
Marital status						
Currently married (ref)	1.0	1.0	1.0	1.0	1.0	1.0
Never married	1.0(0.8-1.2)	0.9(0.7-1.1)	1.0(0.8-1.3)	0.9(0.7-1.2)	0.8(0.5-1.2)	0.8(0.5-1.2)
Separated	1.6(1.1-2.2)	1.4(1.0-2.0)	1.7(1.2-2.5)	1.5(1.0-2.2)	0.8(0.3-2.8)	0.8(0.2-2.6)
Divorced	1.6(1.2-2.0)	1.4(1.1-1.8)	1.6(1.2-2.0)	1.4(1.1-1.8)	2.0(0.9-4.3)	1.9(0.9-4.1)
Widow/er	5.2(3.0-9.0)	5.3(3.0-9.3)	5.3(2.9-9.5)	5.5(3.0-10.0)	7.3(1.6-33.8)	5.3(1.0-26.6)
Education						
Illiterate (ref)	1.0	1.0	1.0	1.0	1.0	1.0
Able to read	0.7(0.4-1.2)	0.7(0.4-1.2)	0.7(0.4-1.4)	0.7(0.4-1.3)	0.5(0.1-1.5)	0.5(0.1-1.5)
Primary	0.8(0.7-1.0)	0.9(0.7-1.1)	0.9(0.7-1.1)	1.0(0.8-1.2)	0.6(0.4-0.9)	0.6(0.4-0.9)
Secondary	0.7(0.5-0.8)	0.8(0.6-1.0)	0.7(0.5-0.9)	0.9(0.6-1.1)	0.5(0.3-0.8)	0.5(0.3-0.9)
Tertiary	0.2(0.1-0.4)	0.3(0.2-0.5)	0.3(0.1-0.6)	0.4(0.2-0.7)	0.1(0.0-0.4)	0.1(0.0-0.5)
Occupation						
Student(ref)	1.0	1.0	1.0	1.0	1.0	1.0
Self employed	2.8(1.9-4.3)	2.6(1.7-3.9)	2.9(1.8-4.7)	2.5(1.5-4.1)	2.7(1.1-6.7)	2.5(1.0-6.2)
Employed at public/ private	2.5(1.7-3.7)	2.3(1.5-3.4)	2.4(1.5-3.9)	2.2(1.3-3.5)	2.7(1.3-5.6)	2.6(1.3-5.4)
Unskilled laborer	2.5(1.9-3.3)	2.2(1.6-2.9)	2.4(1.7-3.3)	2.0(1.4-2.8)	3.2(1.8-5.6)	2.8(1.6-5.0)
Uniformed worker	0.7(0.2-2.9)	0.6(0.1-2.5)	NA	NA	1.0(0.2-4.4)	1.0(0.2-4.2)
Farmer	1.7(1.0-3.1)	1.4(0.8-2.6)	1.2(0.4-4.2)	0.9(0.3-3.2)	1.9(0.9-4.2)	1.7(0.8-3.8)
Driver	2.0(0.8-4.6)	1.7(0.7-4.0)	NA	NA	2.5(1.0-6.6)	2.3(0.9-6.0)
FSW	6.1(3.9-9.5)	2.6(1.6-4.2)	5.8(3.6-9.2)	2.2(1.3-3.7)	NA	NA
Small business	3.0(1.6-5.7)	2.7(1.4-5.1)	2.2(0.8-5.7)	1.8(0.7-4.9)	4.5(1.8-11.0)	4.1(1.6-10.1)
Other (not mentioned)	2.8(2.0-4.1)	2.2(1.5-3.2)	2.9(1.9-4.4)	2.0(1.3-3.0)	2.5(1.1-5.7)	2.5(1.1-5.5)
Sexual behavior/STI						
Ever had sex						
No (ref)		1.0		1.0		1.0
Yes		2.7(1.7-4.3)		3.3(1.8-6.2)		2.2(1.1-4.2)
Had sex in exchange for money/gifts						
No (ref)		1.0		1.0		
Yes		2.1(1.6-2.6)		2.4(1.8-3.1)		
History of STI						
No (ref)		1.0		1.0		1.0
Yes		2.9(2.2-3.9)		2.7(1.9-3.8)		3.7(2.2-6.2)
Previously tested						
No (ref)		1.0		1.0		1.0
Yes		0.5(0.4-0.6)		0.5(0.4-0.6)		0.6(0.4-0.9)
Likelihood Ratio-test (P Value)		291.2 (p<0.0001)		101.3 (p<0.0001)		13.49 (p<0.001)

VII. Discussion

The analysis of this study attempts to provide insights about the prevalence of HIV and risk factors to HIV among young people aged 15-24, which constituted 55% (37,771 young clients) of the overall tested people (69,141) from July 2007 – December 2008 who attended mobile counseling and testing services.

As shown in this study, a higher proportion of young people exhibited sexual experience as 51.9% (12,514) of males and 60.1% (8,217) of females ever had sexual contacts as compared to findings in the country [5,8,16]. Early initiation of sexual debut, delayed marriage and high unemployment could be the reasons of sexual practices exacerbated with multiple partners [11-14]. Sexual experience is more likely higher among young females than young males. The study finding also showed us that only 33.9% (6,745) of young clients, with a two times higher among males than females, used a condom during their most recent sexual encounter. Condom use among young clients, in general, is very low as observed in BSS 2 [16]. The study also depicted a significant proportion of young clients have multiple casual partners, which in most cases show heterosexual behavior among young clients vis a vis to the unusually high proportion of young people experienced sexuality. Of all (5,601) who have casual partners, 14.6% (818) have multiple casual partners. This finding shows us the apparently high rate of having multiple sexual partners among young MCT clients in contrast to the results found in country reports [5,8,11-14,16]. This shows that heterosexual contact is the most important risk factor that puts young people at risk of acquiring HIV. Reported STI exposure appeared to be lower in MCT clients than results found in DHS 2005 (2.0% each among females and males) and other country reports [5,8,16]. Self reported commercial sex was noted as 1.7% (237) among young females.

This study showed an overall HIV prevalence of 2.4 with a female to male ratio of 5:1. It was observed an increase of HIV rate among sexually active people than not-active that imply the major means of HIV transmission is heterosexual contact [3-5,8,15-16,53]. Though it is hard to compare MCT and DHS due to methodological differences and the characteristics of study subjects, HIV prevalence pronounced more in MCT than the findings in recent DHS among the age brackets 15-19 and 20-24 (MCT: 3.0% among 15-19 and 4.4% among 20-24; DHS 2005: 2.0% among 15-19 and 2.8% among 20-24) [8].

Prevalence of HIV varied among young client's marital status, education and occupational status. A high HIV prevalence was documented among separated/divorced/widowed (9.9%). There are several attributing factors for the high prevalence among the afore-mentioned groups. Some of the widows may be infected by their spouses who died of AIDS and others may have divorced or separated as a result of HIV infection [8]. As explained in this analysis, education has an inverse relationship with HIV infection with the highest among illiterates (6.8%) and the lowest among those in tertiary education level (0.7%). Certain occupation categories (female sex workers, self employed, employed at public/private, unskilled laborers and those engaged in small businesses/petty trades) appeared to exhibit high HIV prevalence than the rest of the groups. As expected, HIV rate among female commercial sex workers (18.9%) was the highest from the rest of the study subjects, which is in agreement with the mean infection rate observed in studies conducted back to 1988 [18-19] while lower than that observed in 1990 (50%) [20]. Surprisingly, the prevalence among farmers (1.5%) seemed to be higher than the prevalence among the rural population observed in the DHS 2005 [8]. The lowest HIV rate was noted among students and armed forces (0.7% each).

Sexual activity among young women was pragmatic in acquiring HIV as the HIV prevalence among sexually experienced women seemed very high as compared to those who had no sexual experience. Country reports and literatures [16,25,56-57] show that high risk sex has been a major cause of HIV infection among young people particularly among sexually active unmarried young clients [24]. HIV prevalence was ten times higher among those who reported having sexual experience compared to those who reported never having sex. A 4.7:1of female to male ratio of HIV prevalence was also noted in this same group. The small HIV prevalence of 0.4% among those who reported never having had sex may be a combination of possible infection via non-sexual route and underreporting of sexual behavior by some of the clients. A higher HIV prevalence (15.0 – 19.2%) was observed among women reporting multiple casual partners. The study also showed a dose-response relationship between HIV prevalence and the numbers of casual sexual partners (both sexes). The noted dose-response effect appeared much more dominant in females. The findings also revealed that HIV prevalence was observed low among young clients who used a condom during their recent sexual encounter compared to those who didn't use condom (3.6% vs 4.2%). Clients who reported having transactional sex exhibited a four times higher HIV prevalence (11.0%) than who didn't practice transactional sex (3.4%).

As studies in Ethiopia [55] and elsewhere in the country [56-58] have shown that sexually transmitted infections enhance HIV transmission apart from STIs classified as one of the risk factors for acquiring HIV. In line with this, the findings of this study also confirmed the afore-mentioned relationship between HIV and STIs. A 14.2% HIV prevalence was documented among clients reporting having had STI in their lifetime, which is significantly higher than the 4.8% among those who did not report STD.

Generally, the findings of this study suggest that HIV affects young people involved in low economic status jobs/occupation, less educated, young people practicing risky behaviors of not using condom during their sexual encounters, those that ever contracted STI, and those young people who have multiple sexual partners.

According to the results of a multivariate analysis all of the socio demographic variables included in the logistics regression model are found to be significantly related to the prevalence of HIV. Gender of young clients, age, marital status, occupation, and education are appeared to influence the outcome of young people's HIV status. However, being female, being in age group 20-24, young clients who are separated/divorced/widowed, attended a secondary or tertiary education level, and being a self or employed at public/private sector, unskilled laborer, female sex worker, and being engaged in small businesses appeared to carry excess risk of HIV infection. Similarly, adjusting the interaction effect of sexual behavior variables with socio-demographics, client's sexual experience, having had transactional sex, history of STI, and client's previous test status affect the rate of HIV infection.

In conclusion, low socioeconomic status and high risk behaviors have been found to be significantly associated with HIV infection. This indicates the need for bringing about an appropriate prevention strategy. Considering the prevailing high HIV prevalence among young MCT clients in general and certain groups (females, FSWs, men and women who are separated/divorced/widowed, men and women who have multiple sexual partners, and those involved in low economic status jobs) in particular, suggests a need for strong referral linkages to established/strengthened both to other prevention programs as well as to care and support facilities.

This study has few limitations that worth to mention. The inherent limitation of any VCT data is that clients are not a random sample of the general population and, as a result, recorded HIV infection rate in the MCT is subjected to self-selection bias when extrapolated to the general young population. The other limitation is the self-reported sexual behaviors, condom use and STDs often subjected to social desirability biases; and hence reported behaviors do not provide a full account of the problem.

The clients' intake form, which is used as a national VCT data collection form together with VCT register, is not comprehensive and somehow lacks specificity in terms of the questions it asks about sexual behaviors, occupational profile and steady and casual partners (which ask only 6 months prior to the test), among others. This limits the scope of the study to few sexual behavioral characteristics. Moreover, there might have other possible individual and contextual confounding risk factors for HIV infection that might not be adequately controlled for.

The study may also be compromised the quality of data due to counselor's fatigue of counseling and testing sessions and give less attention for recording and reporting. Direct observation of the counseling sessions by trained and experienced VCT supervisors and regular in-depth orientation of counselors have been provided to solve such data quality problems.

Comparison of the study findings was made with DHS results just to quote as an aggregate level and not meant to breakdown the overall prevalence as well as sexual characteristics of young population by Region and Town levels. Comparing findings of young people's risk

factors to HIV by Town and Regional level may cause problems as the DHS and MCT didn't use similar methods of data collection and sample representation of the population.

In spite of the afore-mentioned limitations, the analysis of this study gives insight about the measurement of HIV prevalence and the risk factors associated with HIV among young people in urban areas of Ethiopia. The findings of this study are also useful for program managers and HIV implementers to identify at-risk segments of young people to link them to other prevention, care and support services in the country. The MCT had also been strong point of providing post-test counseling and made referrals for HIV-positive young clients to care and support services (pre-ART, ART, TB, STI and other on-going counseling) as an advantage and benefit for study participants.

VIII. Conclusions and Recommendations

Conclusions

- Young women in particular and others in certain occupational profiles (female sex workers, unskilled laborers, self employed and employed at public/private, and those engaged in small businesses) and those who are separated/divorced/widowed disproportionately carried excess risk of HIV
- Heterosexual contact remains the most important factor for young people in MCT sites that puts them at-risk of HIV on top of the low utilization of condom and with high rate of multiple sexual partners
- Young people's most important reason for testing for HIV was to plan their future followed by their perceived risk of acquiring HIV
- The study couldn't respond to why young people practice low use of condom during their recent sexual encounters vis a vis to the high rate of having multiple sexual partners
- The study was limited its scope to few sexual and behavioral questions; and hence other contextual and behavioral factors could influence young people's HIV positivity.

Recommendations

- ✓ There is a need to focus in targeting towns with high concentration of at risk young people and those having disproportionately high HIV infection risk through effective community mobilization strategies.
- ✓ There is a need to develop a strategy to link young people at higher risk to other prevention programs as low condom utilization, having had multiple sexual partners,

ever contracted STIs, and having transactional sex were noted high among these segments of the population.

- ✓ There should be a strong referral linkage between HIV-positive young MCT clients and referral facilities for pre-ART/ART, TB, STI and other care and support services
- ✓ This study also suggests to conduct further in-depth research on why clients in certain occupational groups carry excess risk of HIV infection and why condom use was low among those who practiced high-risk sex
- ✓ The study informs us to consider refinement/modification of the data collection tool (client intake form) to capture important sexual behavior questions for better results and targeting of young people who are at higher risk of HIV (eg. life time sexual partners, consistent use of condom, having had paid sex, modifying the question of history of STIs – with specific symptoms of STDs, are some among others)

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X. Annexes

Annex 1: Client Intake Form